STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
PACIFIC CASCADE REGION

AFTER HOURS

ROAD PLAN

SECTION 11, TOWNSHIP 11 NORTH, RANGE 11 EAST, W.M.
LEWIS COUNTY

LEWIS DISTRICT

AGREEMENT NO.: 30-078843 LEAD FORESTER: Brooke Acosta

DATE: 03/01/2006 STAFF ENGINEER: Joe Smith

DRAWN & COMPILED BY: Alicia Compton

SECTION 0 – SCOPE OF PROJECT

This project includes, but is not limited to new construction including:

clearing;
grubbing;
right-of-way debris disposal;
excavation and/or embankment to subgrade;
landing construction;
acquisition and installation of drainage structures;
acquisition, manufacture, and application of rock;
road deactivation;
grass seeding.

This project also includes but is not limited to reconstruction including:

Road	Station (s)	Requirements
W-500	99+38	Replace current 36” CMP w/ designed structure as shown in Section 6 and Culvert List

This project also includes but is not limited to pre-haul maintenance including:

Road	Station (s)	Requirements
W-538	0+00 to 36+91	Grade and shape road to junction of W-538 F as specified on the typical section sheet
W-538 F	0+00 to 14+93	Grade and shape road to junction of W-538 F.1 as specified on the typical section sheet

This project also includes but is not limited to abandonment including:

medium abandonment.

SECTION 1 - GENERAL CLAUSES

1.1-1

Clauses in this plan apply to all construction, reconstruction, pre-haul maintenance or abandonment including landings unless otherwise noted.

1.1-2

Construction, reconstruction, and pre-haul maintenance of the following roads is required. All roads shall be constructed, reconstructed or pre-haul maintained on the State's location and in accordance with this Road Plan.

Road	Stations	Type
W-500	99+38	Reconstruction
W-538	0+00 to 36+91	Pre-haul maintenance
W-538 F	0+00 to 14+93	Pre-haul maintenance
W-538 F.1	0+00 to 1+28	Construction

1.1-3

Construction of the following roads is not required. Roads used by the Purchaser shall be constructed on the State's location and in accordance with this Road Plan.

Road	Stations	Type
W-500 A	0+00 to 4+01	Construction
W-500 B	0+00 to 4+38	Construction
W-500 C	0+00 to 8+18	Construction
W-538 F.1	1+28 to 9+81	Construction

1.1-4

If the Purchaser desires a road location or design change, a revised Road Plan shall be submitted to the State for consideration.

1.1-5

On this plan quantities are minimum acceptable values. Additional quantities required by the State because of hidden conditions or Purchaser's choice of construction season or techniques shall be at the Purchaser's expense. Hidden conditions include, but are not limited to: solid subsurface rock, subsurface springs, saturated ground, and unstable soil.

1.1-7

Hauling of forest products or equipment may require a county road hauling permit. Purchaser is responsible for obtaining a permit, and any costs associated with extra maintenance or repair levied by a county.

1.1-10

Abandonment of the following roads is required. All roads shall be abandoned in accordance with this Road Plan.

Road	Stations	Type
W-538 F.1	1+28 to 9+81	Medium

1.2-1

The construction, reconstruction, abandonment or pre-haul maintenance of any roads specified herein shall not be permitted between September 30 and May 1 unless authority to do so is granted, in writing, by the Contract Administrator.

1.2-2

Purchaser shall not use roads constructed, reconstructed, or pre-haul maintained under this Road Plan for hauling, other than timber cut on the right-of-way, without written approval from the Contract Administrator.

1.2-3

The following roads shall be constructed using a track mounted hydraulic excavator, unless otherwise authorized, in writing, by the Contract Administrator.

Road	Stations
W-500 A	0+00 to 4+01
W-500 B	0+00 to 4+38
W-500 C	0+00 to 8+18
W-538 F.1	0+00 to 9+81

1.2-6

Pioneering shall not extend past construction that will be completed during the current construction season. Drainage shall be provided on all uncompleted construction as approved, in writing, by the Contract Administrator.

Clearing and grubbing shall be completed prior to starting excavation and embankment.

Culvert placement in live streams shall precede embankment where culverts are to be placed along natural ground. Temporary diversion culverts shall be provided when designed culverts are elevated above natural ground within embankments.

Culverts shall be installed in completed subgrade as construction progresses.

Subgrade, ditches, and culvert installations shall be completed and are subject to written approval by the Contract Administrator prior to rock application, and/or timber haul.

1.3-1

Rock hauling shall not be permitted between the dates listed unless authorized, in writing, by the Contract Administrator.

1.3-2

Roads are intended for dry weather use. Hauling shall be suspended when wheel track rutting exceeds 6 inches unless Purchaser elects to correct the situation at his/her own expense. Corrective measures and continued operations are subject to written approval by the Contract Administrator.

1.4-2

The following road shall be reconstructed in accordance with construction stakes.

Road	Station
W-500	99+38

1.4-3

Reference points (R.P.'s) that are moved or damaged at any time during construction shall be reset in their original locations by the Purchaser. Excavation and embankment shall not proceed on road segments controlled by said R.P.'s until all moved or damaged R.P.'s are reset.

1.5-1

Maintenance on roads listed in Contract Clauses C-50 (Purchaser Road Maintenance and Repair) and C-60 (Designated Road Maintainer) shall be performed in accordance with Forest Access Road Maintenance Specifications.

1.5-2

Roads shall be maintained in a condition that will allow the passage of light administrative vehicles.

1.5-3

Snowplowing shall not be permitted unless authorized, in writing, by the Contract Administrator.

1.5-3

Snowplowing will be permitted only after execution of a “Snow Plowing Agreement”, which is available from the Contract Administrator upon request.

SECTION 2 - CLEARING

2.1-1

Fell all vegetative material larger than 2 inches DBH or over 5 feet high between the marked right-of-way boundaries or if not marked in the field, between clearing limits specified on TYPICAL SECTION SHEET.

2.1-2

Deck all merchantable right-of-way timber. The decks shall be parallel to the road centerline and within the cleared right-of-way. The decks shall be free of dirt, limbs and other right-of-way debris, and removable by standard log loading equipment from the road bed.

2.1-3

Right-of-way timber shall not be decked within the grubbing limits or in locations that interfere with the construction of the road prism or impede drainage.

SECTION 3 - GRUBBING

3-1

All stumps shall be removed that fall between grubbing limits shown on the TYPICAL SECTION SHEET. Those outside the grubbing limits but with undercut roots shall also be removed.

3-2

Grubbing limits are defined as the entire area between the external limits shown on the TYPICAL SECTION SHEET.

3-3

Within waste areas, removal of stumps shall not be required.

3-5

Organic material shall be excluded from the road subgrade width as shown in TYPICAL SECTION SHEET.

SECTION 4 - DEBRIS DISPOSAL AND REMOVAL

4.1-1

Right-of-way debris is defined as all nonmerchantable vegetative material larger than one cubic foot in volume within the grubbing limits.

4.1-2

All right-of-way debris disposal shall be completed prior to the application of rock and/or timber haul.

4.2.3-1

Right-of-way debris shall be scattered outside the grubbing.

4.2.3-2

Right-of-way debris shall not be placed against standing timber.

4.2.3-3

Unsplit stumps shall be positioned upright, with root wads in contact with the forest floor.

SECTION 5 - EXCAVATION

5.1-1

Unless controlled by construction stakes or specific design sheets herein, roads shall be constructed or reconstructed in accordance with dimensions shown on the TYPICAL SECTION SHEET.

5.1-2

Purchaser shall not bury merchantable material.

5.1-3

Road grade and alignment shall conform to the State's marked location. Grade and alignment shall have smooth continuity, without abrupt changes in direction.

Construction limitations are as follows:

Favorable Grade	Adverse Road Grade	Minimum Curve Radius
18%	12%	60 feet

Changes in road grade shall not exceed 6% within 100 feet. Adverse grades on curves shall not exceed 10% of the curve radius. Favorable grades through switchbacks shall not exceed 12%. Transition grades entering and leaving switchbacks shall not exceed a 5% grade change.

5.1-3 continued

A switchback is defined as a curved segment of road between a beginning and end of the same curve, where the change of traffic travel direction is greater than 90 degrees.

Transition grades required to meet switchback grade limitations shall be constructed on the tangents preceding and departing from the switchbacks.

5.1-4

Minimum extra widening on the inside of curves shall be:

5 feet extra	80 to 100 foot radius curve
7 feet extra	60 to 80 foot radius curve

5.1-5

Curve widening, where required, shall be added to the inside of curves.

5.1-6

Adverse grades on curves shall not exceed 10 percent of the curve radius.

5.1-7

Roads shall be constructed to the dimensions shown on the TYPICAL SECTION SHEET, within the tolerance listed below. Tolerance classes for each road are listed on the TYPICAL SECTION SHEET.

Tolerance Class	A	B	C
Road Width (feet)	+1.5	+1.5	+2.0
Subgrade elevation (feet +/-)	0.5	1.0	2.0
Centerline alignment (feet lt./rt.)	1.0	1.5	3.0

5.1-8

Excavation slopes shall be constructed no steeper than shown on the following table except as construction staked or designed:

Material Type	Excavation Slope Ratio
Common Earth (on side slopes of 55%)	1:1
Common Earth (55% to 70% sideslopes)	¾:1
Common Earth (on slopes over 70%)	½:1
Fractured or loose rock	½:1
Hardpan or solid rock	¼:1

5.1-9

Excavation and embankment slopes shall be constructed to a uniform line and left rough for easier revegetation.

5.1-10

Except as construction staked or designed, Embankments shall be widened as follows:

Height at Centerline	Subgrade Widening
Less than 6 feet	2 feet
6 feet or over	4 feet

5.1-11

Embankment slopes shall be constructed no steeper than shown on the following table except as construction staked or designed:

Material Type	Embankment Slope Ratio
Common Earth and Rounded Gravel	1½:1
Angular Rock	1¼:1
Sandy Soils	2:1

5.1-12

Organic material shall be excluded from road subgrade, or embankment as shown on the TYPICAL SECTION SHEET

5.1-16

Turnout locations noted on this plan are approximate. Locations shall be adjusted to fit with final subgrade alignment and sight distances. Location shall be subject to written approval of the Contract Administrator.

5.1-18

Turnarounds shall be no larger than 30 feet long and 30 feet wide. Location shall be subject to written approval of the Contract Administrator.

5.1-20

Purchaser shall construct ditches and excavation slopes to provide sufficient width for ditches and road surface. Excavated slopes shall be consistent with Clause 5.1-8. Excavated material shall be scattered outside the grubbing limits, end hauled or pushed to designated waste areas

5.1.1-1

Waste material shall not be deposited within 50 feet of a cross drain culvert installation.

5.1.1-2

Waste material shall not be deposited within 100 feet of a live stream, or within a riparian management zone.

5.1.1-3

Waste material may be deposited adjacent to the road prism on side slopes up to 45 percent if the waste material is compacted and more than 100 feet away from live streams. On side slopes of 45 percent or more, all excavation shall be end hauled or pushed to designated embankment sites.

5.1.1-5

When constructing landings, waste material and embankment shall not be placed on side slopes steeper than 45%.

5.1.1-8

The amount of material to be contained in a waste area shall be at the discretion of the Contract Administrator.

5.1.1-9

Purchaser shall remove existing culvert and embankment as specified in this Road Plan. Excavated material shall be re-used, end hauled or pushed to designated waste areas as directed by the Contract Administrator.

Road	Stations	Waste Area Location
W-500	99+38	110+00

5.1.2-1

Select borrow shall contain no more than 5% dirt, vegetative debris, or other waste material by volume.

5.1.2-2

Select borrow shall be used at the following locations:

Road	Stations
W-500	99+38

5.1.2-3

Select borrow may be obtained by re-using excavation material on site if approved by the contract administrator. Additional material may be obtained from a designated stockpile at the W-500 Quarry in Section 14, Township 11 North, Range 3 East, W.M., or any commercial pit as approved by the Contract Administrator. Development of the rock source shall be in accordance with the attached narrative.

5.2-1

Road pioneering operations shall not undercut the final cut slope, deposit excavated material outside the grubbing limits, or restrict drainage.

5.3-3

Embankments shall be compacted in lifts not to exceed 24 inches. Compaction shall consist of three coverages over the entire width of each lift with a vibratory drum roller weighing a minimum of 14,000 pounds at a maximum operating speed of 3 mph. For embankment segments too narrow to accommodate a drum roller, a plate compactor shall be used. With a plate compactor three full coverages shall be made in 12 inch lifts.

5.4-1

Silt-bearing runoff shall not be permitted to go into streams.

5.4-2

Accomplish sediment removal through silt traps, silt fences, settling ponds, or other methods as approved, in writing, by the Contract Administrator.

5.4-3

Purchaser shall seed excavation and embankment slopes. Application rate shall be 40 pounds seed per acre. Seed will be provided by the Purchaser.

5.4-3.1

Purchaser shall furnish and evenly spread the seed mixture listed below on all exposed soil inside the grubbing limits at a rate of 40 pounds per acre. The date of application is subject to approval by the Contract Administrator.

Mixture Percent by Weight	Minimum Percent Germination
50% Fescue, Red	90% Germination
25% Ryegrass, Perennial	90% Germination
15% Bentgrass	85% Germination
10% Clover, White and White Dutch (inoculated)	90% Germination

Weed seed shall not exceed 0.5% by weight.

Seed shall be furnished in standard containers on which the following shall be shown:

1. Common name of seed
2. Net weight
3. Percent of purity
4. Percentage of germination
5. Percentage of weed seed and inert material

Required seed not spread by the termination of this contract shall become property of the State. The amount owed to the State shall be as follows, less the amount spread.

Road	Stations	Seed Quantity (lbs)
W-500 A	0+00 to 4+01	10
W-500 B	0+00 to 4+38	10
W-500 C	0+00 to 8+18	20
W-538 F.1	0+00 to 9+81	10

5.4-6

On the following roads, Purchaser shall stabilize excavation and embankment slopes by applying Heavy Rip Rap. Heavy Rip Rap shall be applied in quantities specified in the ROCK LIST to exposed soil on the entire embankment at such a depth as to prevent surface erosion of slope.

Road	Stations
W-500	99+38

5.5-4

Constructed subgrades shall be compacted full width except ditch prior to rock application. Compaction shall be by a smooth-drum vibratory roller weighing at least 14,000 pounds. Four complete passes shall be made at a maximum operating speed of 3 mph.

5.5-5

Finished subgrade shall be crowned as shown on the TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

5.5-6

On the following road, a grader shall be used to shape the existing surface and the surface shall be compacted full width except ditch. Compaction shall be by smooth-drum vibratory roller weighing at least 14,000 pounds. Four complete passes shall be made at a maximum operating speed of 3 mph.

Road	Stations
W-538	0+00 to 36+91
W-538 F	0+00 to 14+93

SECTION 6 - DRAINAGE

6.1-2

Berms shall be removed from shoulders to permit escape of runoff.

6.2.1-1

Purchaser shall furnish, install, and maintain galvanized culverts meeting AASHTO Specification No. M-36 corrugated polyethylene pipe (AASHTO specification No. M-294 Type S) and on culverts over 24 inches, aluminized culverts (meeting ASTM A 819, AASHTO M-274 aluminized steel Type 2 and AASHTO M-36 specifications) as designated on the CULVERT LIST. Culvert and flume lengths shall be varied to fit as-built conditions subject to written approval by the Contract Administrator.

6.2.1-1.1

On the following roads, Purchaser shall install and maintain culverts of the length and diameter specified on the CULVERT LIST. Culverts may be new or used steel, cast iron, plastic, concrete, or such other material as approved by the Contract Administrator.

Road	Stations
W-538 F.1	1+28 to 9+81

6.2.1-2

Annular corrugated bands and culvert ends shall be used on metal culverts. On culverts 24 inches and smaller, bands shall have a minimum width of 12 inches, on culverts over 24 inches, bands shall have a minimum width of 24 inches. Manufacturer's approved connectors shall be used for corrugated polyethylene pipe.

6.2.1-5

On required roads: culverts, downspouts, flumes, bands, and gaskets as listed on the CULVERT LIST which are not installed shall become property of the State. Purchaser shall stockpile materials as directed by the contract administrator.

6.2.1-6

Metal, concrete, or plastic culverts and bands removed from the road bed shall be removed from State land prior to termination of this contract.

6.2.1-7

On the following road, installation of culvert shall be in accordance with Hydraulics Project Approval, CULVERT INSTALLATION DETAIL, and LIVE STREAM CULVERT REMOVAL PROCEDURE.

Road	Stations
W-500	99+38

6.2.2.1-1

Culvert, downspout, flume, and energy dissipator installation shall be in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL and the National Corrugated Metal Pipe Association "Installation Manual for Corrugated Steel Drainage Structures", and the Corrugated Polyethylene Pipe Association "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."

6.2.2.1-2

Purchaser shall provide rubberized gaskets for all culverts with a vertical rise greater than 42 inches.

6.2.2.2-1

Any damaged galvanized coating or cut ends shall be retreated with a minimum of 2 coats of zinc rich paint.

6.2.2.3-1

Cross drains and surface culverts on road grades in excess of 3% shall be skewed at least 30 degrees from perpendicular to the road centerline, except that cross drain culverts at the low points of dips in roads shall not be skewed.

6.2.2.3-2

Cross drain culverts shall be installed at a slope steeper than the incoming ditch grade, but not less than 3% nor more than 10%.

6.2.2.4-1

Installations of culverts 30 inches in diameter and over shall be subject to written approval by the Contract Administrator or District Engineer or their designee prior to making backfill.

6.2.2.5-1

Drainage structure outfalls shall not terminate directly on unprotected soil that will erode. Downspouts, flumes, and energy dissipators shall be installed to prevent erosion.

6.3-1

Ditches shall be constructed concurrently with construction of the subgrade. Ditches shall drain to culverts, ditchouts, and natural drainages.

6.4-1

Catch basins shall be constructed to resist erosion in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL. Minimum dimensions: two feet wide and four feet long with backslopes consistent with Clause 5.1-8: Excavation Slopes.

6.5-1

Headwalls shall be constructed in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL at all cross drain culverts except for temporary culverts.

6.5-2

On the following road, embankment slopes adjacent to culvert inlet and outlets at live stream crossings shall be armored with machine placed heavy loose riprap for a distance of 2 culvert diameters on each side of the pipe and one culvert diameter above the pipe in accordance with the CULVERT LIST.

Road	Stations
W-500	99+38

SECTION 7 - ROCK

7.1-1

Rock for construction, reconstruction and/or pre-haul maintenance under this contract may be obtained from a source on State land as listed below at no charge to the Purchaser. Development and use shall be in accordance with the attached written "Development Plan" prepared by the State. Upon completion of operations, the rock source shall be left in the condition specified in said plan, subject to approval by the Contract Administrator. Use of material from any other source must have prior written approval from the Contract Administrator. If other operators are using or desire to use this rock source, a joint operating plans shall be developed. All parties shall follow this plan. Purchaser shall give the Contract Administrator 5 days notice prior to commencing any operations in the listed rock pits.

Source	Location
W-500 Quarry	Sec. 14, T11N, R03E, W.M.

7.1-3

All rock source operations shall be conducted as directed by the Contract Administrator and in accordance with an approved development plan on file at the Pacific Cascade Region office.

7.1-4

Rock for maintenance of roads under this contract may be obtained from an existing stockpile on State land as listed below at no charge to the Purchaser. Purchaser shall remove no more than 500 cubic yards of 2.5" INCH MINUS CRUSHED rock.

Source	Location
W-500 Quarry	Sec. 14, T11N, R03E, W.M.

7.1-6

Rock for construction, reconstruction, or pre-haul maintenance under this contract may be obtained from any commercial source as approved in writing by the Contract Administrator.

7.2.1.1-3

1½ INCH MINUS CRUSHED ROCK

% passing 1½" square sieve	100%
% passing 1" square sieve	70 - 90%
% passing ⅝" square sieve	50 - 80%
% passing ¼" square sieve	30 - 50%
% passing U.S. #40 sieve	3 - 18%
% passing U.S. #200 sieve	7.5% Max.

All percentages are by weight.

7.2.1.1-5

2½ INCH MINUS CRUSHED ROCK

% passing 2½" square sieve	100%
% passing 2" square sieve	65 -100%
% passing 1" square sieve	50 - 70%
% passing ¼" square sieve	30 - 50%
% passing U.S. #40 sieve	16% Max.
% passing U.S. #200 sieve	5% Max.

All percentages are by weight.

7.2.1.1-8

4 INCH IN PLACE rock shall have a minimum of 90 percent of the top 4 inches of the running surface pass a 4 inch square opening. In place processing such as grid rolling, jaw crushing, or other such method as demonstrated by the Purchaser to be effective, shall be required if necessary to achieve this requirement.

7.2.1.1-11

QUARRY SPALLS

% passing 8" square sieve	100%
% passing 3" square sieve	40% Max.
% passing ¾" square sieve	10% Max.
% passing U.S. #40 sieve	16% Max.
% passing U.S. #200 sieve	5% Max.

All percentages are by weight.

7.2.1.1-12

Landing rock shall be no coarser than PIT RUN Rock

7.2.1.2-2

PIT RUN rock shall contain no more than 5 percent by weight of vegetative debris, dirt, or trash. Pit run rock will meet the following specifications for rock gradation when placed on the subgrade: No more than 10% of the rock shall be larger than 8 inches in any dimension and no rock shall be larger than 12 inches in any dimension

7.2.3-1

Measurement of rock shall be on a cubic yard truck measure basis. Each truck box shall be measured by the Contract Administrator prior to rock hauling. The Contract Administrator shall periodically require that a load be flattened off and its volume calculated. An average of such volumes for each truck shall be used to tally the volume to be hauled. The Purchaser shall provide and maintain load tally sheets for each truck and shall give them to the Contract Administrator upon request.

7.2.4-1

Rock drilling and shooting shall meet the following specifications:

a. Oversize material remaining in the rock source at the conclusion of the timber sale shall not exceed 5 percent of the total volume mined for the sale. No oversize material shall remain in the rock source at the termination of this timber sale.

b. Oversize material is defined as rock fragments larger than two feet in any dimension.

c. The Purchaser shall submit an informational drilling and shooting plan to the Contract Administrator 7 working days prior to any drilling. (Form #M-126PAC).

7.4.2-1

Apply at least the minimum required rock depth as shown on the ROCK LIST. Required and optional rock shall meet the specifications on the ROCK LIST.

7.4.2-4

If hauling shall take place only from May 1 to September 30, Purchaser may not be required to place or provide the optional rock in the ROCK LIST. Purchaser shall then be required to submit a written plan for approval by the Contract Administrator describing how these roads shall be constructed, used, and abandoned in compliance with all other clauses in the ROAD PLAN.

7.4.2-5

Subgrade shall be approved, in writing, by the Contract Administrator prior to application of rock.

7.4.2-6

On the following roads, a grader shall be used to shape the existing surface prior to timber haul.

Road	Stations
W-538	0+00 to 36+91
W-538 F	0+00 to 14+93

7.4.2-8

Apply 50 cubic yards of rock to each landing from a rock source subject to written approval by the Contract Administrator.

7.4.2-9

Turnarounds, turnouts, and curve widening shall have rock applied to the same depth and specifications as the traveled way.

7.4.2-10

Each lift of rock shall be crowned as shown on TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

7.4.3-1

Rock shall be mixed, compacted, and graded in sections not to exceed 1/2 mile in length. Water shall be added in quantities to facilitate compaction. If directed by the Contract Administrator, a minimum of 6 gallons of water per cubic yard of rock shall be applied.

7.4.3-2

Rock shall be spread and compacted full width in lifts not to exceed 12 inches uncompacted depth. Compaction shall be by pneumatic-tired or steel-wheeled smooth drum vibratory roller or vibratory Elliot grid, weighing at least 14,000 pounds. Four complete passes at a maximum speed of 3 mph shall be made on each lift.

7.4.4-1

Riprap shall consist of angular stone, placed on shoulders as indicated in this plan, or as directed by the Contract Administrator.

Loose Riprap - The stone for loose riprap shall be hard, sound and durable. It shall be free from segregation, seams, cracks, and other defects tending to destroy its resistance to weather. Loose riprap shall be free of rock fines, soil, or other extraneous material.

a. Heavy Loose Riprap - Shall meet the following requirements for grading:

At Least/Not More Than	Minimum Size	Maximum Size
40% / 90%	1 Ton (2 cu. yd.)	--
70% / 90%	300 lbs. (2 cu. ft.)	--
10% / 30%	--	50 lbs.

b. Light Loose Riprap - Shall meet the following requirements for grading:

At Least/Not More Than	Size Range	Maximum Size
20% / 90%	300 lbs. to 1 ton	--
80% / --	50 lbs. to 1 ton	--
10% / 20%	--	50 lbs.

7.4.4-2

Riprap shall be set in place in conjunction with or immediately following construction of the embankment. Placement shall be by zero drop height methods only.

SECTION 9 - ROAD AND LANDING DEACTIVATION

9.1-1

The following roads shall be deactivated by the Purchaser prior to the termination of this contract.

Road	Stations
W-500 A	0+00 to 4+01
W-500 B	0+00 to 4+38
W-500 C	0+00 to 8+18

9.1-2

Deactivation shall consist of:

constructing drivable water bars in conformance with the attached WATER BAR DETAILS at a maximum spacing which will produce a vertical drop of no more than 10 feet between water bars or between natural drainage paths and with a maximum spacing of 200 feet;

skewing water bars at least 30 degrees from perpendicular to the road centerline on roads in excess of 3% grade;

keying water bars into ditchline;

grass seeding, concurrently with deactivation and in accordance with clause 5.4-3.1.

9.2-1

Purchaser shall reduce or relocate landing debris, in a manner approved, in writing, by the Contract Administrator, to avoid landing failures and potential debris slides.

9.2-2

Purchaser shall provide for drainage of the landing surface as approved, in writing, by the Contract Administrator.

9.2-3

Landing embankments shall be sloped to original construction specifications.

SECTION 10 - ROAD AND LANDING ABANDONMENT

10.1-1

The following road shall be abandoned by the Purchaser prior to the termination of this contract and according to the ROAD ABANDONMENT CROSS SECTIONS DETAIL

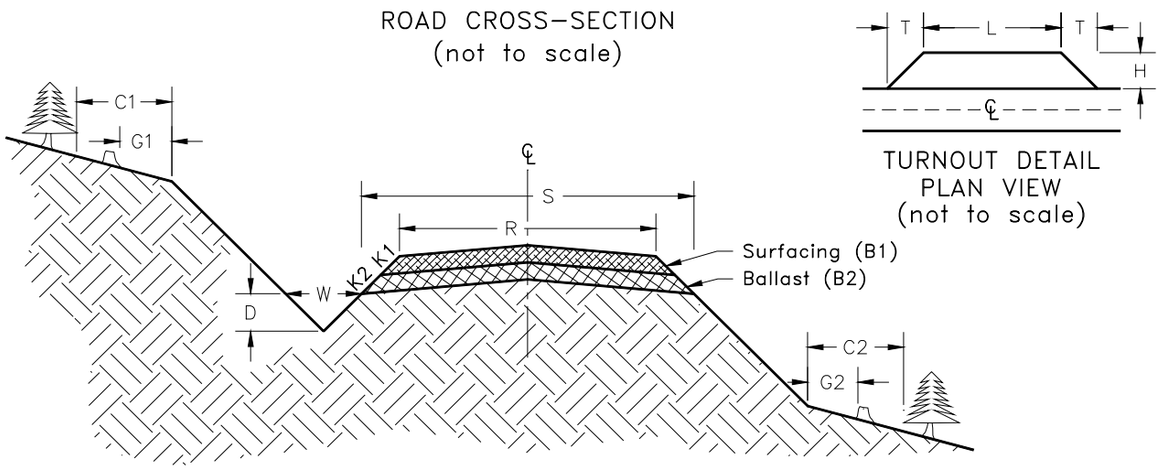
Road	Stations	Type
W-538 F.1	1+28 to 9+81	Medium

10.1-3

Medium Abandonment shall consist of:

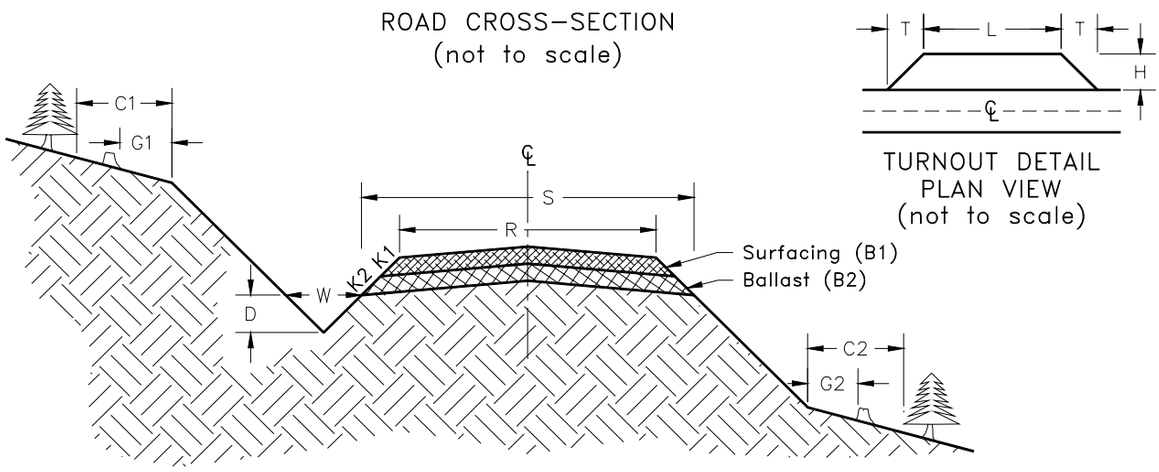
work shall be performed between July 1 and September 30;
filling the ditches;
ripping the surface to a minimum depth of 18 inches;
outsloping the surface at a minimum of 20% or natural slope (whichever is less);
construction of tank trap barrier in conformance with the attached "T" TANK TRAP DETAIL;
removing ditch cross drain culverts and leaving the resulting trench open;
sloping all trench walls and approach embankments no steeper than 1.5:1;
grass seeding concurrently with abandonment and in accordance with Clause: 5.4-3.1;
covering, concurrently with abandonment, all exposed soils within 100 feet of any live stream, with a 8 inch deep layer of straw.
scatter woody debris onto abandoned road surfaces.
constructing non-drivable water bars, as directed by Contract Administrator, in conformance with the attached WATER BAR DETAILS.

TYPICAL SECTION SHEET



Road Number	From Station	To Station	Tolerance Class	Subgrade Width	Road Width	Ditch		Crown in. @ CL	Grubbing Limits		Clearing Limits	
						Width	Depth					
				S	R	W	D		G1	G2	C1	C2
W-500 A	0+00	4+01	C	14	12	3	1	4”	3’	3’	5’	5’
W-500 B	0+00	4+38	C	14	12	3	1	4”	3’	3’	5’	5’
W-500 C	0+00	8+18	C	14	12	3	1	4”	3’	3’	5’	5’
W-538	0+00	36+91	B	14	12	-	-	4”	-	-	-	-
W-538 F	0+00	14+93	B	14	12	-	-	4”	-	-	-	-
W-538 F.1	0+00	1+28	B	14	12	3	1	4”	3’	3’	5’	5’
	1+28	9+81	C	14	12	3	1	4”	3’	3’	5’	5’
W-500	99+38		A	See Culvert Installation Detail								

ROCK LIST
(Page 1 of 2)



BALLAST

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source	Turnout Length	Turnout Width	Turnout Taper
			K2	B2					L	H	T
								W-500 Quarry or commercial source			
					HEAVY LOOSE RIPRAP						
W-500	99+38		Fill Slope Armor				240				
					LIGHT LOOSE RIPRAP						
+W-500	99+38		Stream Simulation Rock				45				
					QUARRY SPALLS						
+W-500	99+38		Stream Simulation Rock				90				
					PIT RUN						
+W-500	99+38		Stream Simulation Rock				90				
*Landings (9)							450				
*Culvert Energy Dissipater (3)							3				
Culvert Energy Dissipater (1)							1				
					4 INCH IN PLACE						
*W-500 A	0+00	4+01	1.5:1	12”	63	4.01	253				
*W-500 B	0+00	4+38	1.5:1	12”	63	4.38	276				
*W-500 C	0+00	8+18	1.5:1	12”	63	8.18	516				
*Culvert Backfill (1)							10				
W-538 F.1	0+00	1+28	1.5:1	15”	81	1.28	104				
Culvert Backfill (1)							10				
*W-538 F.1	1+28	9+81	1.5:1	12”	63	8.53	538				

*Optional Rock
+Quantities combine to create 2.5’ minus stream simulation rock

HEAVY LOOSE RIPRAP TOTAL 240 Cubic Yards
LIGHT LOOSE RIPRAP TOTAL 45 Cubic Yards
QUARRY SPALLS TOTAL 90 Cubic Yards
PIT RUN TOTAL 544 Cubic Yards
4 INCH IN PLACE TOTAL 1,707 Cubic Yards
BALLAST TOTAL 2,626 Cubic Yards

ROCK LIST
(Page 2 of 2)

SURFACE

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Total	Rock Source
			K1	B1				
								W-500 Quarry or approved commercial source
					2 ½ INCH MINUS CRUSHED			
Maintenance Rock	Stockpile						500	
W-500					1 ½ INCH MINUS CRUSHED			
	99+13	99+63	1.5:1	6”			30	
	Culvert Bedding						420	

*Optional Rock

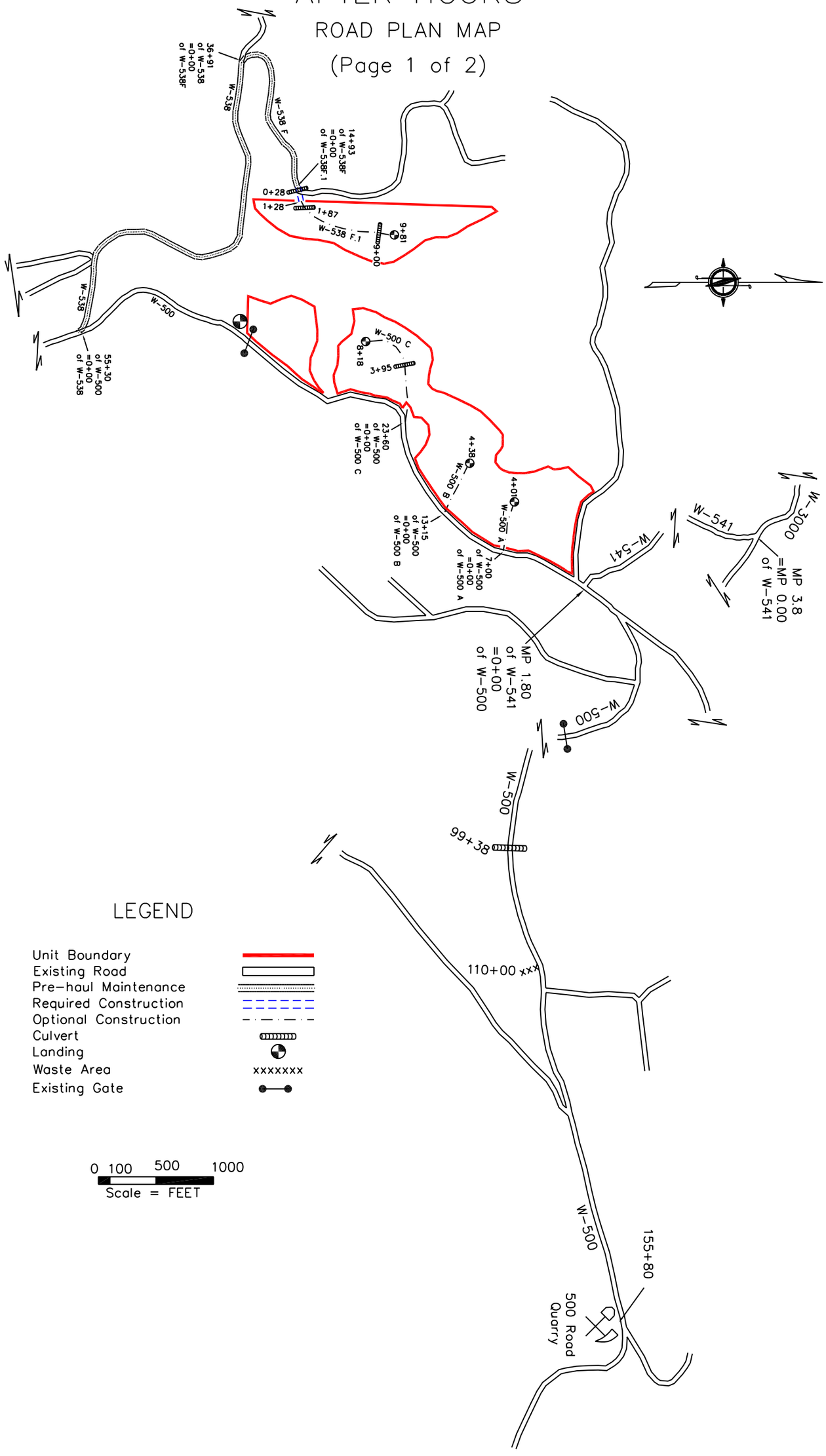
2 ½ INCH MINUS CRUSHED TOTAL 500 Cubic Yards
1 ½ INCH MINUS CRUSHED TOTAL 450 Cubic Yards
SURFACE TOTAL 950 Cubic Yards

If Purchaser elects to haul on optional rock roads in dry weather, the depth listed above is recommended but not required.

AFTER HOURS

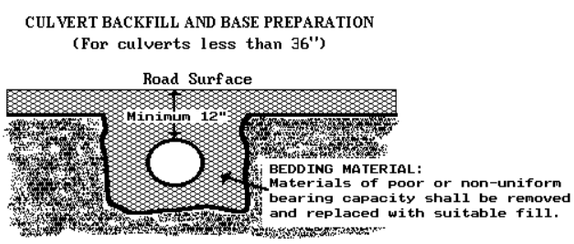
ROAD PLAN MAP

(Page 1 of 2)



CULVERT LIST

Road Number	Location	Culvert Dia.	Culvert Gauge	Length (ft) Culvert	Length (ft) Downspt	Length (ft) Flume	Riprap (C.Y.) Inlet	Riprap (C.Y.) Outlet	Riprap (C.Y.) Type	Backfill Material	Quantity C.Y.	Const. Staked	Remarks
			Steel										
W-500 C	3+95	18”	-	32’	-	-	.5	.5	PR	4”	10	-	
W-538 F.1	0+28	18”	-	32’	-	-	.5	.5	PR	4”	10	-	
	1+87	18”	-	32’	-	-	.5	.5	PR	NT	-	-	
	9+00	18”	-	32’	-	-	.5	.5	PR	NT	-	-	
W-500	99+38	120”	10	62’	-	-	120	120	HL	1 ½	420	Yes	

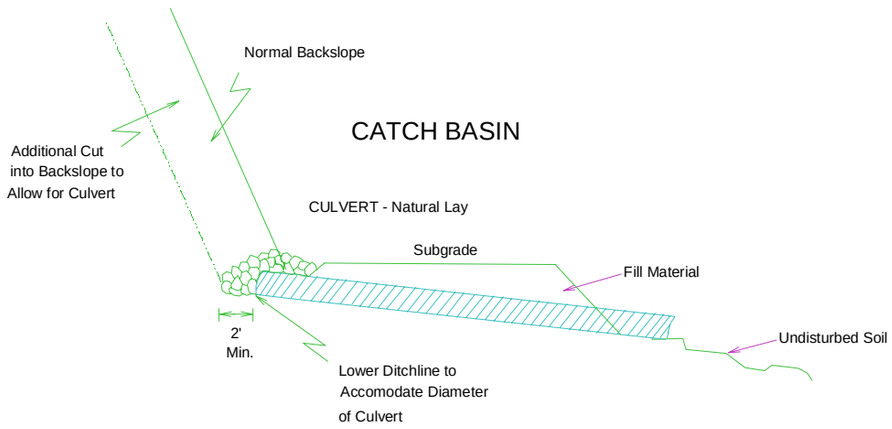


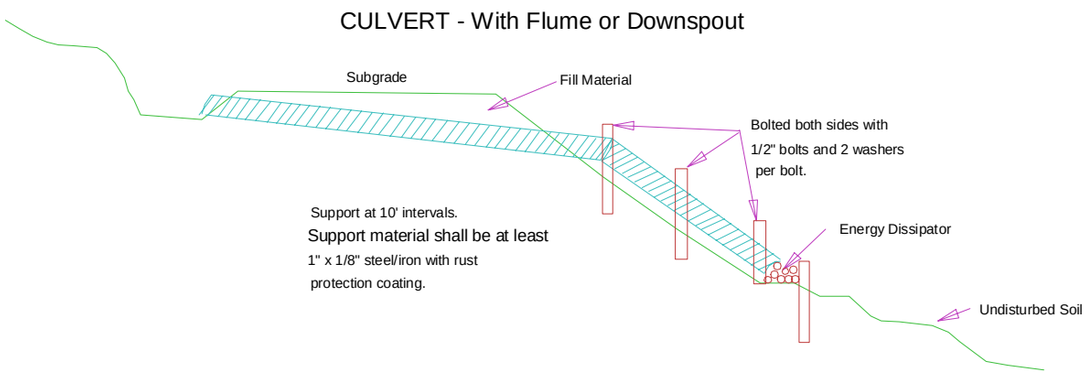
Key:

1 ½ - 1 ½ Inch Minus Crushed Rock
4” - 4” In Place Rock
NT - Native (bank run)
HL - Heavy Loose Riprap
PR - Pit Run Rock

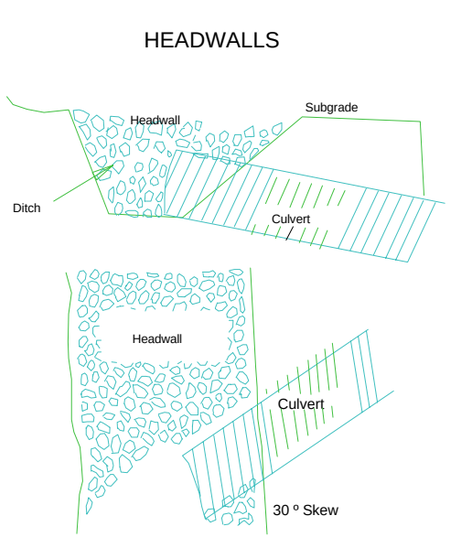
CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 1 of 2)

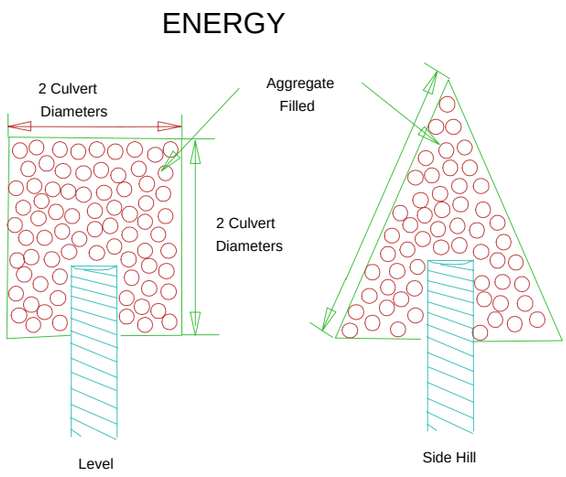




Proper preparation of foundation and placement of bedding material shall precede the installation of all culvert pipe. This includes necessary leveling of the native trench bottom and compaction of required bedding material to form a uniform dense unyielding base. The backfill material shall be placed so that the pipe is uniformly supported along the barrel.



Headwalls to be constructed of material that will resist erosion.



Dissipator Specifications:
Depth: 1 culvert diameter
Aggregate: as specified in the CULVERT LIST.

CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 2 of 2)

POLYETHYLENE PIPE INSTALLATION

INSTALLATION REQUIREMENTS:

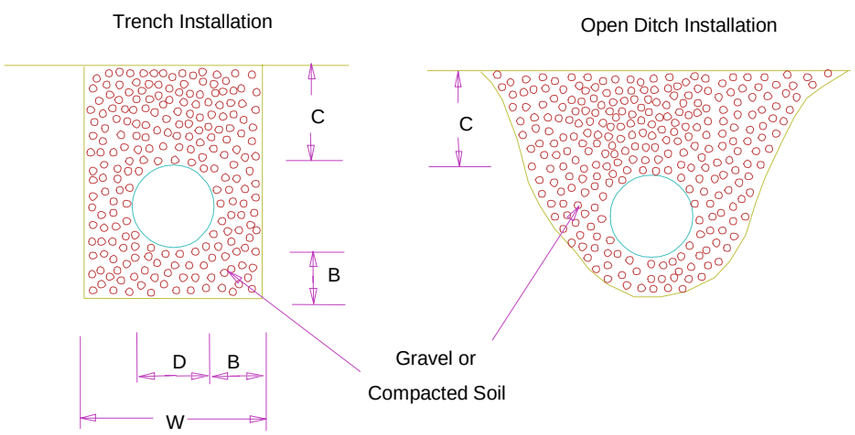
1. Crushed stone, gravel, or compacted soil backfill material shall be used as the bedding and envelope material around the culvert. The aggregate size shall not exceed 1/6 pipe diameter or 4" diameter, whichever is smaller.

2. The corrugated pipe shall be laid on grade, on a layer of bedding material as shown for the two types of installations. If native soil is used as the bedding and backfill material, it shall be well compacted in six inch layers under the haunches, around the sides and above the pipe to the recommended minimum height of cover.

3. Either crushed aggregate or flexible (asphalt) pavement may be laid as part of the minimum cover requirements.

4. Site conditions and availability of bedding materials often dictate the type of installation method used.

5. The load bearing capability of flexible conduits is dependent on the type of backfill material used and the degree of compaction achieved. Crushed stone and gravel backfill materials typically reach a compaction level of 90-95% AASHTO standard density without compaction. When native soils are used as backfill material, a compaction level of 85% of that material is required. This minimum compaction can be achieved by either hand or mechanical tamping. Purchaser shall test the compaction level and bare all associated costs.



MINIMUM DIMENSIONS
Trench or Open Ditch Installation

Nominal Diameter	Minimum Thickness	Minimum Cover	Min. Trench Width
D	B	C	W
18"	6"	12"	36"
24"	6"	12"	42"
30"	6"	12"	48"
36"	6"	12"	54"

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

FOREST ACCESS ROAD
MAINTENANCE SPECIFICATIONS

1. CONSTRUCTION AND RECONSTRUCTION (Prior to acceptance to the contract or acceptance on a timber sale).

A. Cuts and Fills
   1. Maintain slope lines as constructed. Remove slides from the ditches and roadway. Replace fills to 12:1 slopes with selected material or as directed. Remove overhanging material from the cut slopes.
   2. Material from slides or other sources requiring removal shall not be deposited in streams or at locations where it will erode into streams or water courses.
   3. Undesirable slide materials and debris shall not be mixed into the surface material.

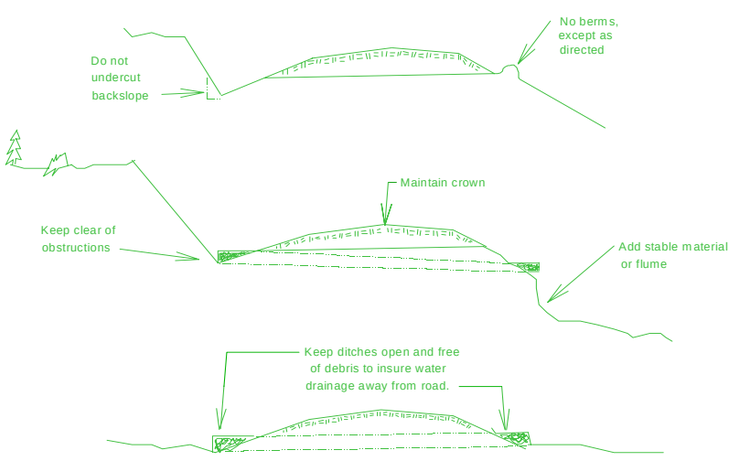
B. Surface
   1. Grade and shape the road surface, turnouts, and shoulders to the original crown, inslope or outslope as directed to provide suitable traveled surface and surface water runoff in an even, unconcentrated manner.
   2. Blading must not undercut the backslope at the bottom of the ditchline or cut geotextile at centerline.
   3. Watering may be required to control dust and to retain fine surface rock.
   4. Desirable surface material shall not be bladed off the roadway.
   5. Replace surface material lost or worn away.
   6. Remove berms except as directed by the State.
   7. Barrel spread soft spots to prevent degradation of geotextile.

C. Drainage
   1. Keep ditches and drainage channels at outlets and inlets of culverts clear of obstructions and functioning as intended.
   2. Inspect and clean culverts at least monthly, with additional inspections during storms and periods of high runoff. This must be done even during periods of inactivity.
   3. Add stable material at the outlet end of the culvert as needed to stabilize the stream bed.
   4. Headwalls: maintain to the road shoulder level with material that will resist erosion.
   5. Keep silt bearing surface runoff from getting into live streams.

D. Structures
   Repair bridges, culverts, cattleguards, fences, and other road structures to the condition required by the construction specifications.

E. Termination of Use or End of Season
   Do maintenance work to minimize damage from the elements such as blading to insure correct runoff, ditch, and culvert cleaning and water bars.

F. Debris
   Remove fallen timber, limbs, and stumps from the slopes or roadway.



STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

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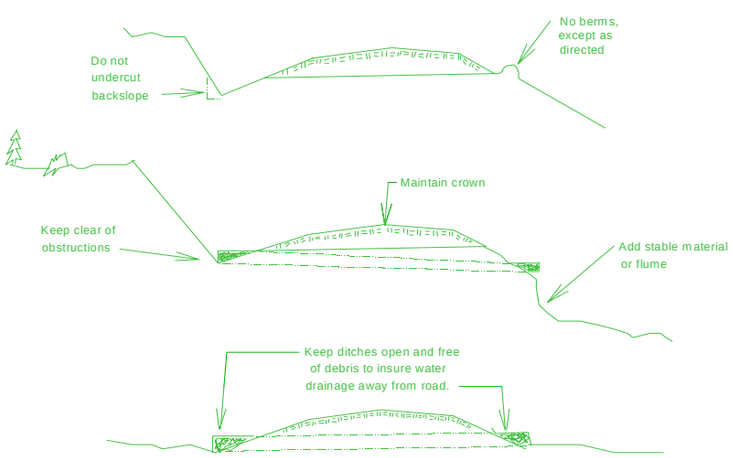
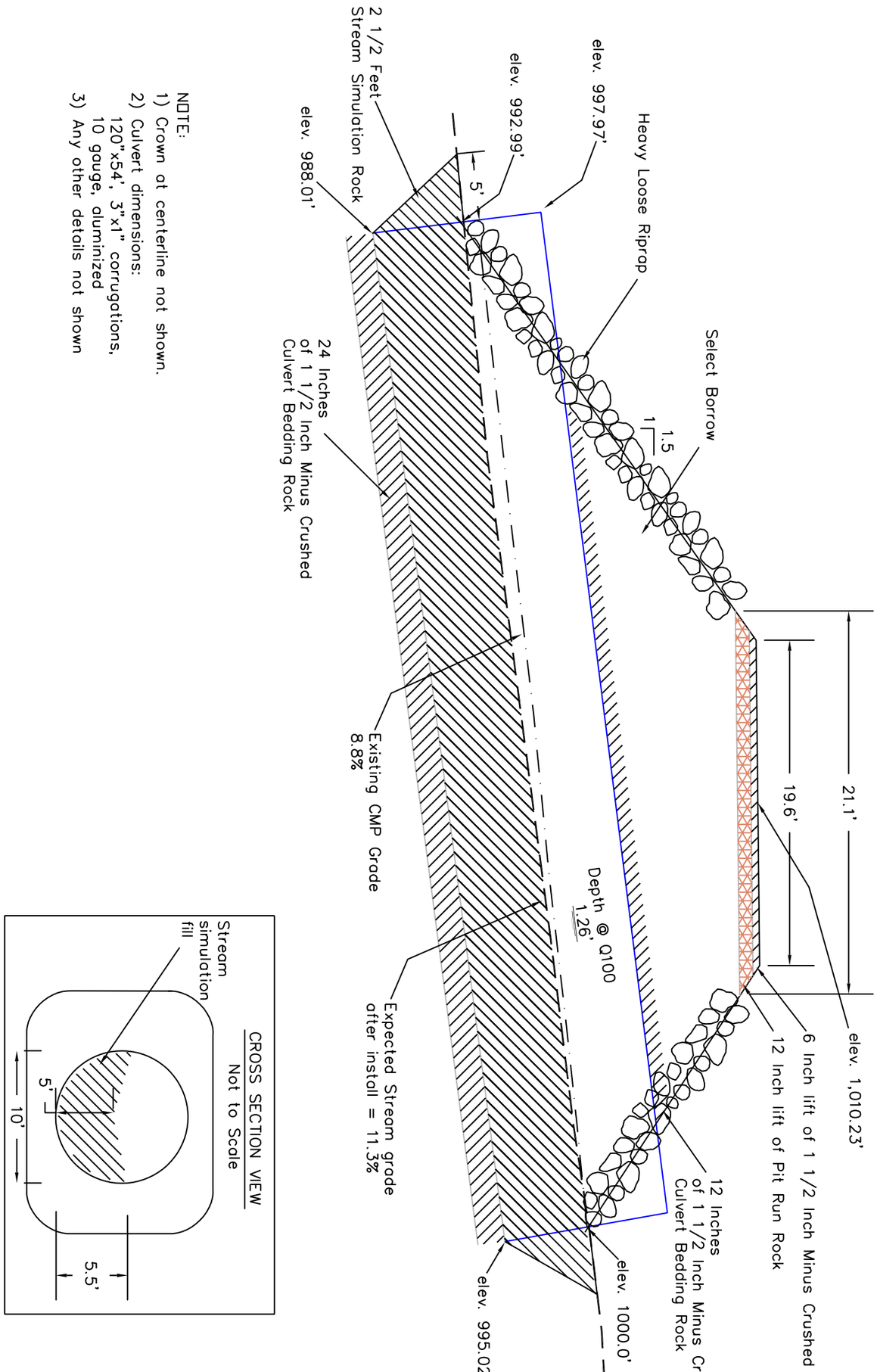


CULVERT INSTALLATION DETAIL
W-500 @ station 99+38
(Page 1 of 2)

PROFILE VIEW

Not to Scale



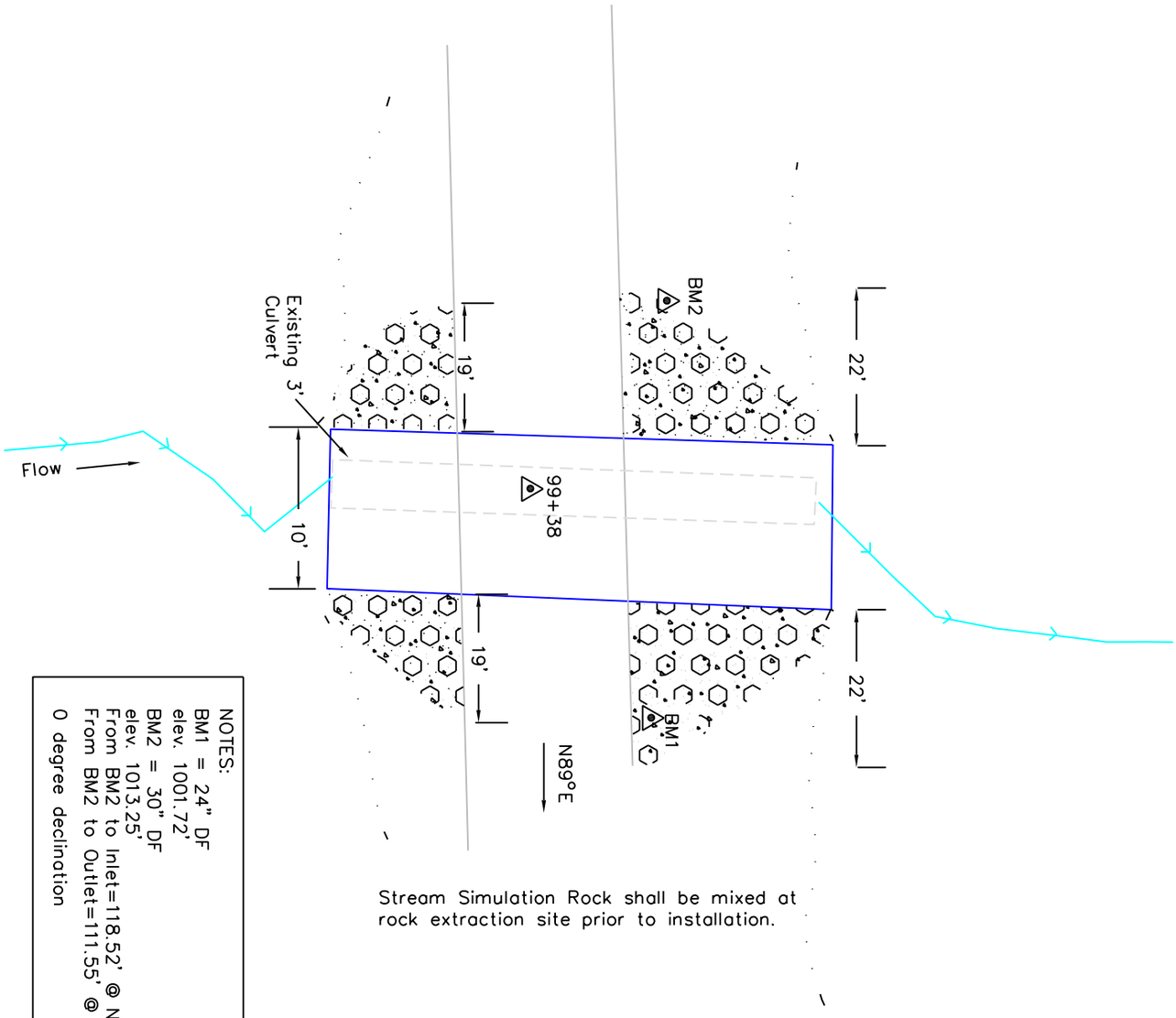
NOTE:
1) Crown at centerline not shown.
2) Culvert dimensions:
120"x54', 3"x1" corrugations,
10 gauge, aluminized
3) Any other details not shown

CROSS SECTION VIEW

Not to Scale

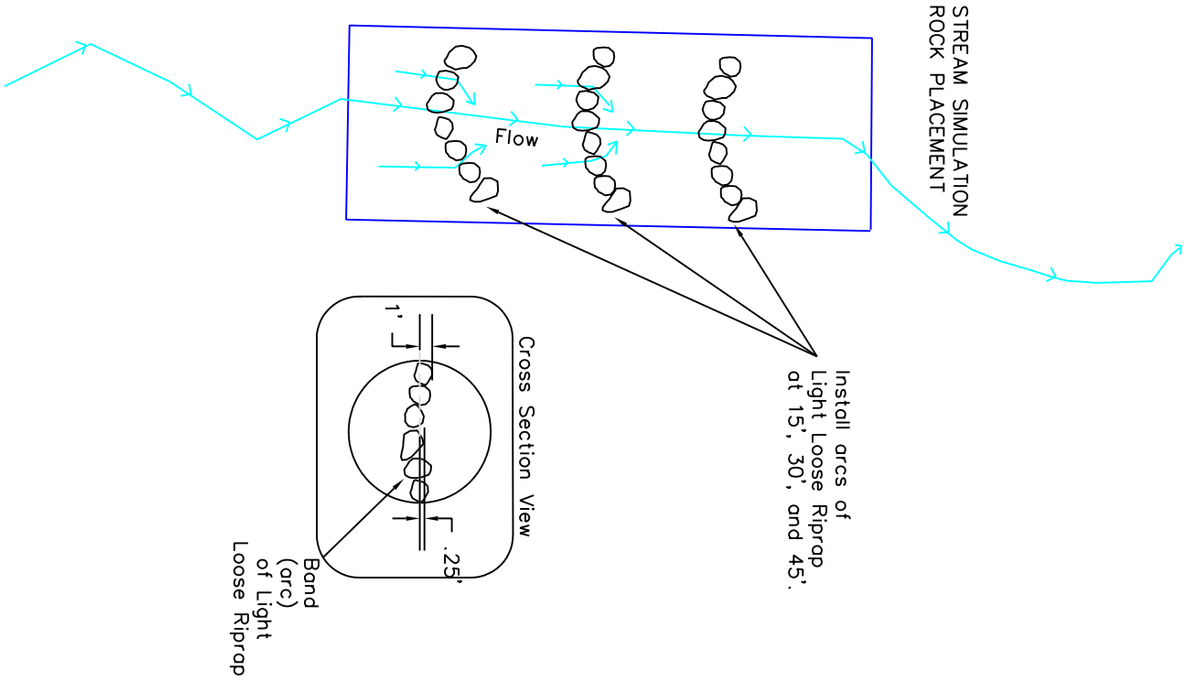
CULVERT INSTALLATION DETAIL
W–500 @ station 99+38
(Page 2 of 2)

PLAN VIEW
Not to scale



Stream Simulation Rock shall be mixed at rock extraction site prior to installation.

NOTES:
BM1 = 24" DF
elev. 1001.72'
BM2 = 30" DF
elev. 1013.25'
From BM2 to Inlet=118.52' @ N59.25°W
From BM2 to Outlet=111.55' @ N89.66°E
0 degree declination



LIVE STREAM CULVERT REMOVAL PROCEDURE

Order of work is as follows, deviations shall be approved, in writing, by the Contract Administrator.

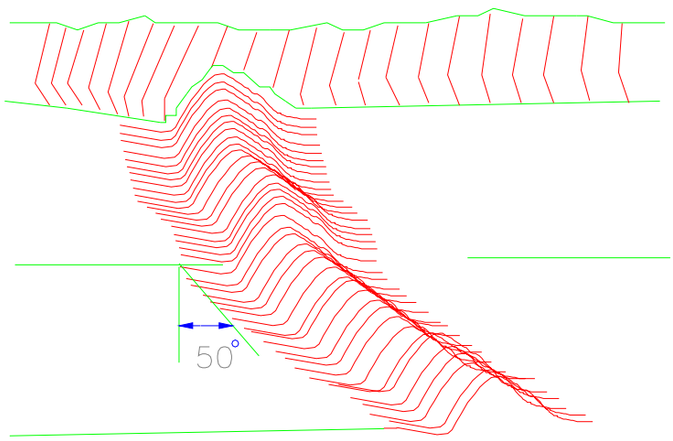
1) Purchaser shall notify the State of intent to start project, and a pre-work conference shall be held before move in of equipment. State will designate a representative that will remain on site at all times when work is being performed in creek channel.
2) Assemble the items on the Materials List onsite before proceeding.
3) Remove 95% of fill (see FILL REMOVAL DETAIL) and end haul to station 110+00 on the W-500 road.
4) Set up pumps (3 required, with one as backup).
5) Dam up stream with sandbags and line floor of dam with plastic (to prevent sub-surface water flow), place clean rock on plastic to hold in place, and key leading edge of plastic into channel bottom - see SETTLING POND AND PUMP DETAIL. Build a settling pond at culvert outlet. Fill may need to be removed before the settling pond installation due to space limitations. Pump clean water at catch basin around work site and back into stream. Dirty water shall be pumped away from site and onto forest floor a minimum of 200 feet from live streams. Silt fence shall be erected at base of fill slope and bottom edge of fence shall be keyed into slope and held in place with rocks to prevent water from flowing under the silt fence.
6) Remove remainder of fill and culvert.
7) Apply Light Loose Riprap to all exposed mineral soil within 3 feet of the live stream.
8) Backfill settling pond.
9) Cover exposed soils within 100 feet of all live streams with straw (minimum depth of 8 inches) and grass seed.

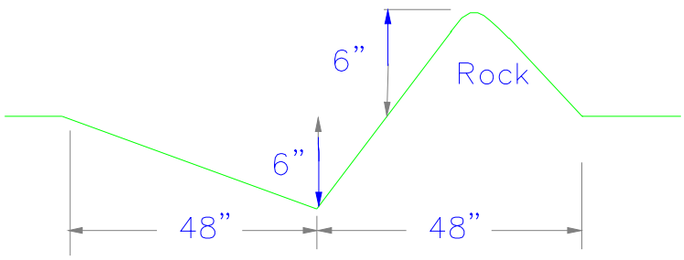
Materials List:

- 3 pumps, (one as a backup) The clean water pump (dam at culvert catch basin) shall have a minimum capacity of 1200 gallons per minute. The dirty water pump (settling pond) and the backup pump shall each have a minimum capacity of 600 gpm. Culvert removal should not start during rain or threat of rain;
- 4,000 square feet plastic sheet;
- 200 feet of silt fence and stakes;
- 30 bales of straw;
- 240 c.y. of riprap.

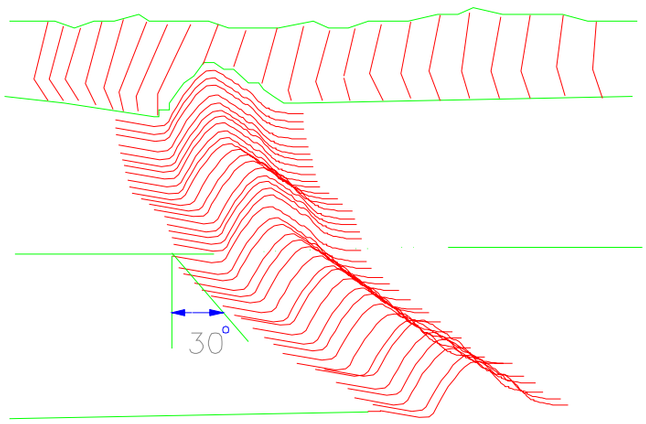
WATER BAR DETAILS

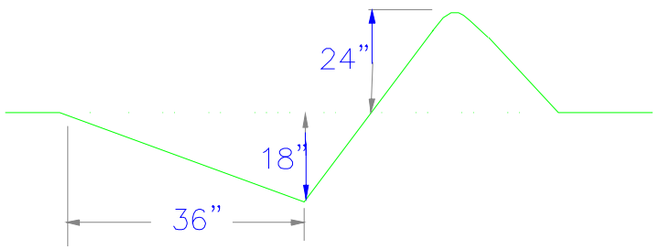
DRIVABLE WATER BAR



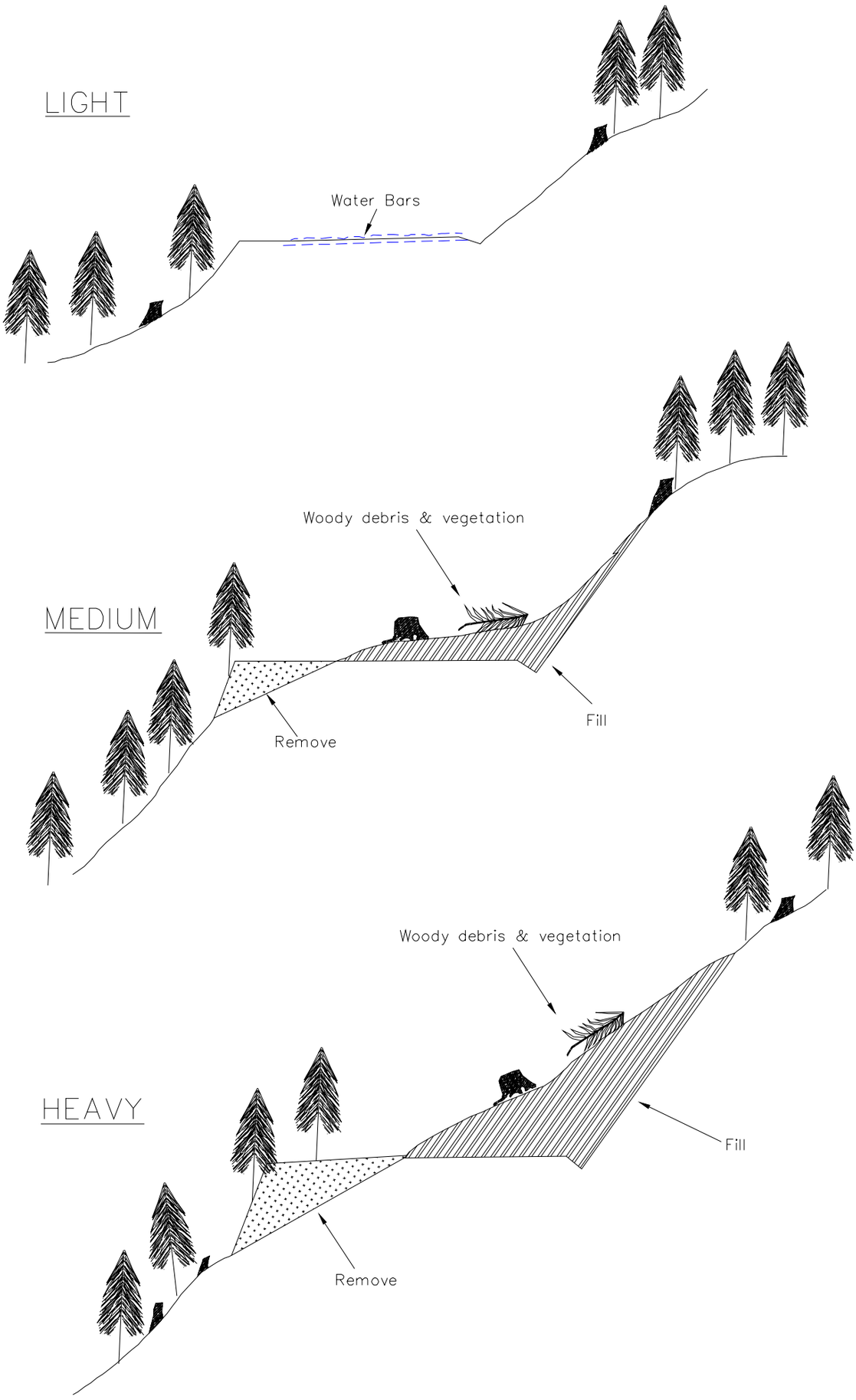


NON-DRIVABLE WATER BAR

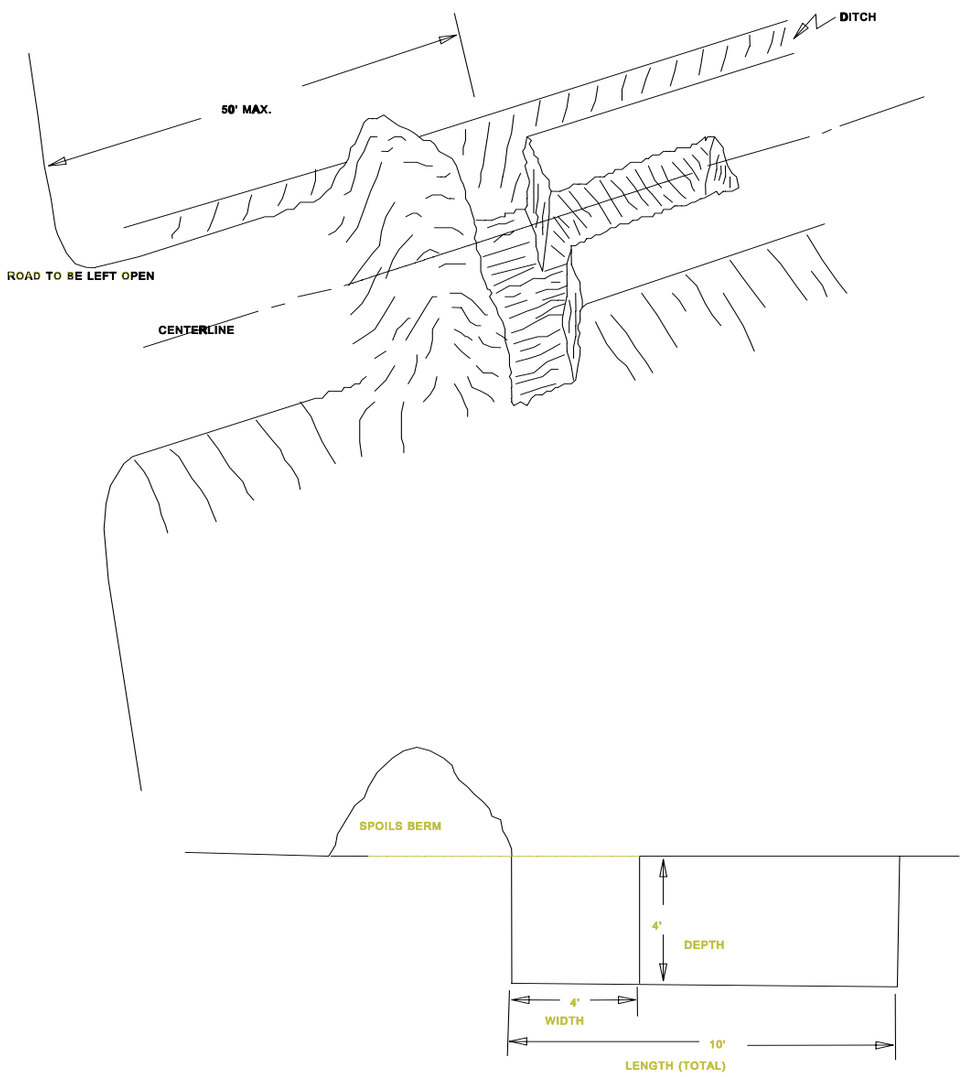




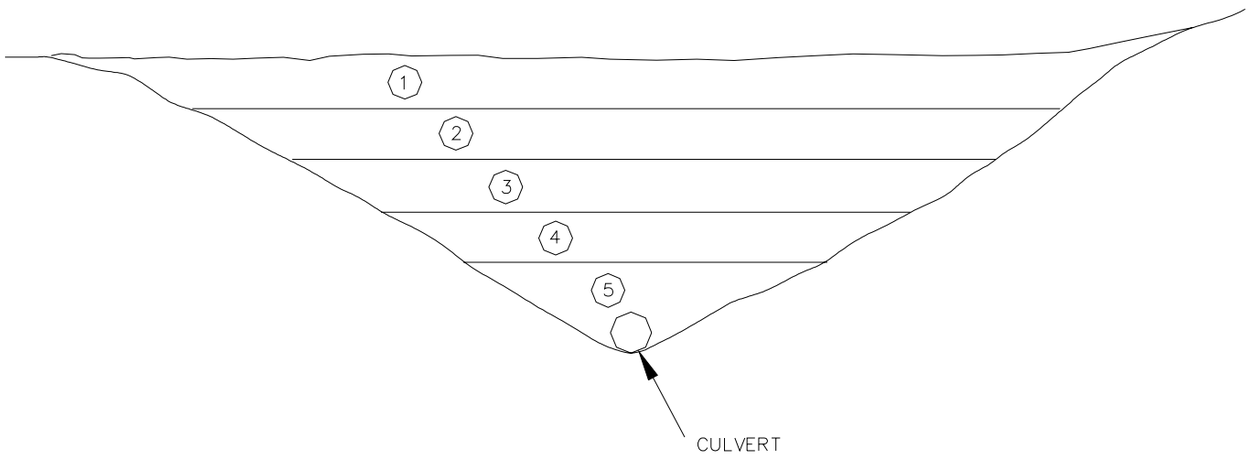
ROAD ABANDONMENT CROSS SECTIONS



"T" TANK TRAP DETAIL

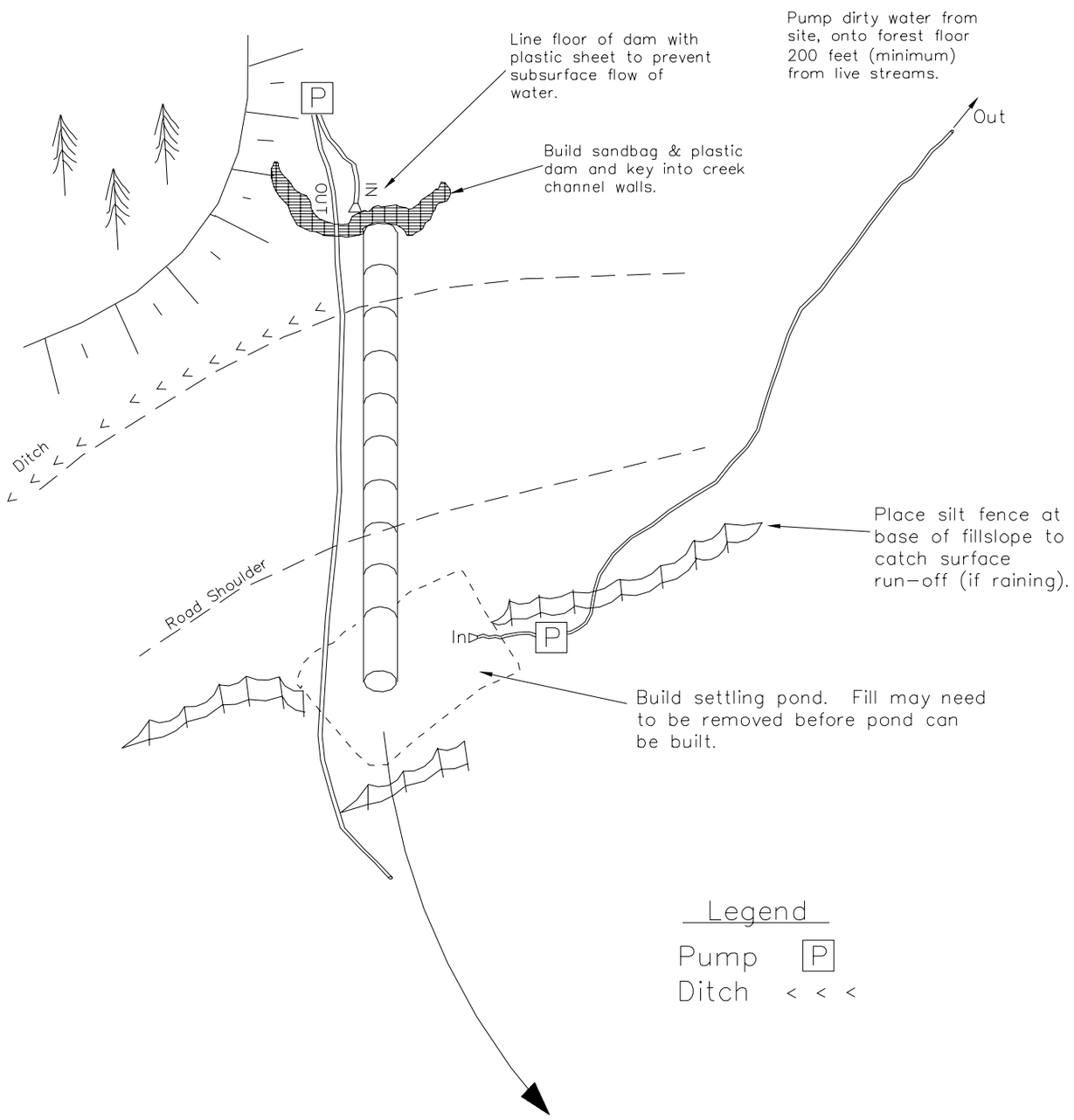


FILL REMOVAL DETAIL



- Remove fill in layers not to exceed 3 feet.
- Channel slopes shall be according to Section 6 – DRAINAGE and the Live Stream Culvert Removal Procedure

SETTLING POND AND PUMP DETAIL



STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
PACIFIC CASCADE REGION

W-500 QUARRY DEVELOPMENT PLAN

SW ¼ SW ¼ SECTION 14, TOWNSHIP 11 NORTH, RANGE 3 EAST, W.M.

1. Oversize material shall be utilized for crushing prior to development in any other area.

2. Mining shall proceed in a fashion which will square up the existing walls to lines AB and CD

3. All vegetation including stumps shall be cleared a minimum of 20 feet beyond the top of all working faces. Trees shall be cleared to a minimum of ¾ of the height of the tallest tree adjacent to the pit.

4. Overburden shall be pushed to the designated waste area and compacted. Minimal acceptable compaction is achieved by placing waste material in 2 foot or shallower lifts and routing excavation equipment over entire width of the lifts.

5. Root wads and organic debris larger than one cubic foot in volume shall be separated from overburden material and piled in the designated waste area.

6. Quarry faces shall not exceed 30 feet in height and shall be sloped no steeper than ½:1.

7. Working bench width shall be a minimum of 30 feet.

8. The quarry floor shall have continuity of slope, providing drainage to the W-500 Rd at a minimum of 2 percent.

9. The location and amount of material to be place din a stockpile are subject to approval of the Contract Administrator.

10. Oversize material remaining in the rock source at the conclusion of use shall not exceed 5 percent of the total volume mined during that operation. Oversize material is defined as rock fragments larger than two feet in any direction. At the conclusion of operations, oversize material shall be placed as directed by the Contract Administrator.

11. At the end of operations, quarry faces and walls shall be scaled and cleared of loose and overhanging material, benches shall have safety berms constructed or access blocked to highway vehicles.

12. All exposed soil in the waste area shall be grass seeded in accordance with Road Plan clause 5.4-3.1.

13. Reclamation will not be required following use.

14. All operations shall be carried out in compliance with all regulations of:

    a. “Regulations and Standards Applicable to Metal and Nonmetal Mining and Milling Operations” (30 CRF) U.S. Department of Labor, Mine Safety and Health Administration.
    b. “Safety Standards – Metal and Nonmetallic Mines, Quarries, Pits, and Crushing Operations” (296-61 WAC), Washington Department of Labor and Industries.
    c. “Safety Standards for Construction Work” (296-155 WAC), Washington Department of Labor and Industries.

15. At least 30 working days prior to blast, initiation of a copy of the Information Blasting Plan (Form M-126CEN) shall be delivered to Williams Gas Pipeline NW, 22909 NE Redmond Fall City Road; Redmond, WA; (425) 868-1010. Purchaser shall notify Williams Gas Pipeline NW 48 hours prior to blasting. A copy of said plan shall be delivered to the Contract Administrator at least 10 working days prior to blasting. Blast initiation is subject to written permission from the Contract Administrator.
    - Operators shall, in no case, lower or penetrate the existing ground profile over the pipeline.
    - Stand off distance from blasting holes to pipeline shall be a minimum of 5 times the blasting hole spacing.

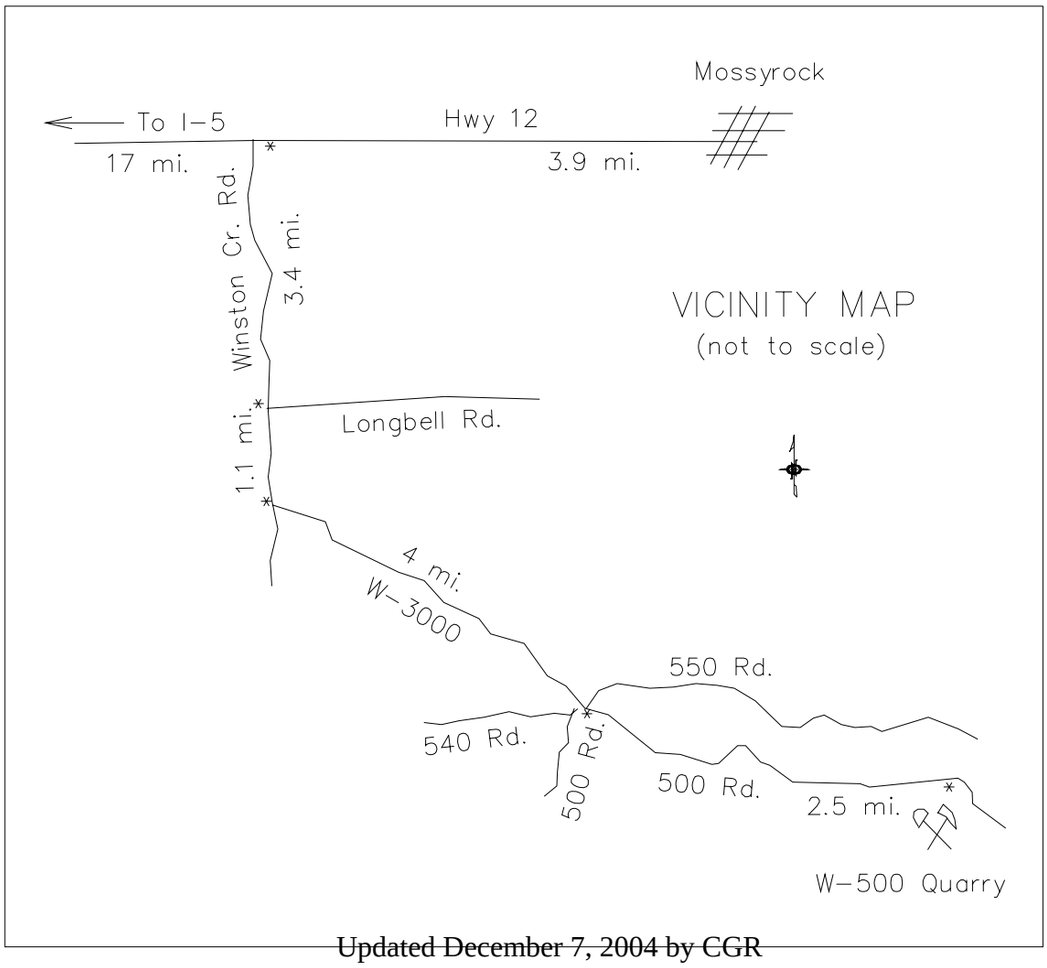
STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
PACIFIC CASCADE REGION

W-500 QUARRY DEVELOPMENT PLAN

SW ¼ SW ¼ SECTION 14, TOWNSHIP 11 NORTH, RANGE 3 EAST, W.M.

16. The Purchaser shall submit an informational drilling and shooting plan to the Contract Administrator 14 working days prior to any drilling (Form #M-126CEN).

17. At the completion of rock source operations, Purchaser shall ask Contract Administrator for written approval of final rock source condition and compliance with the terms of this plan.



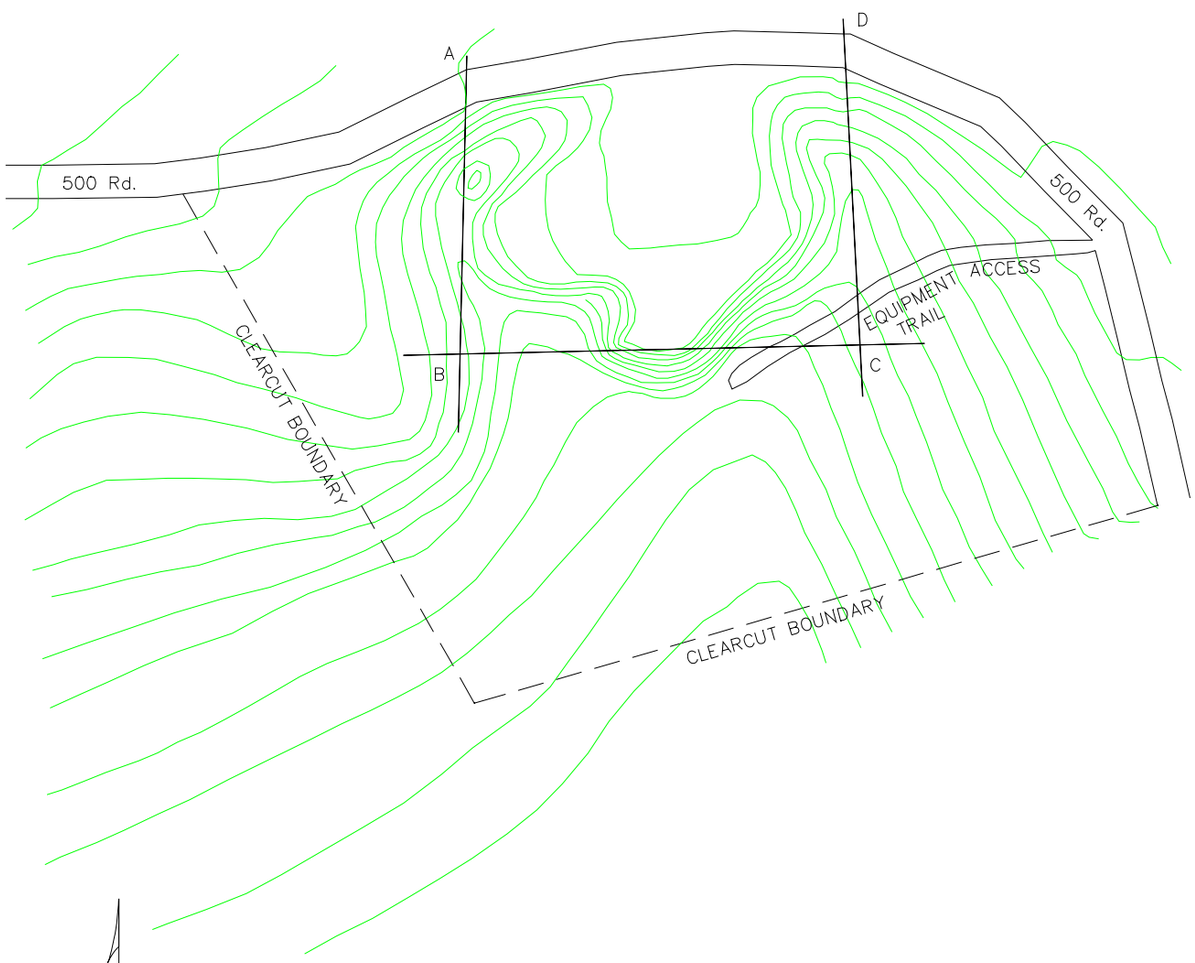
Updated December 7, 2004 by CGR

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
PACIFIC CASCADE REGION

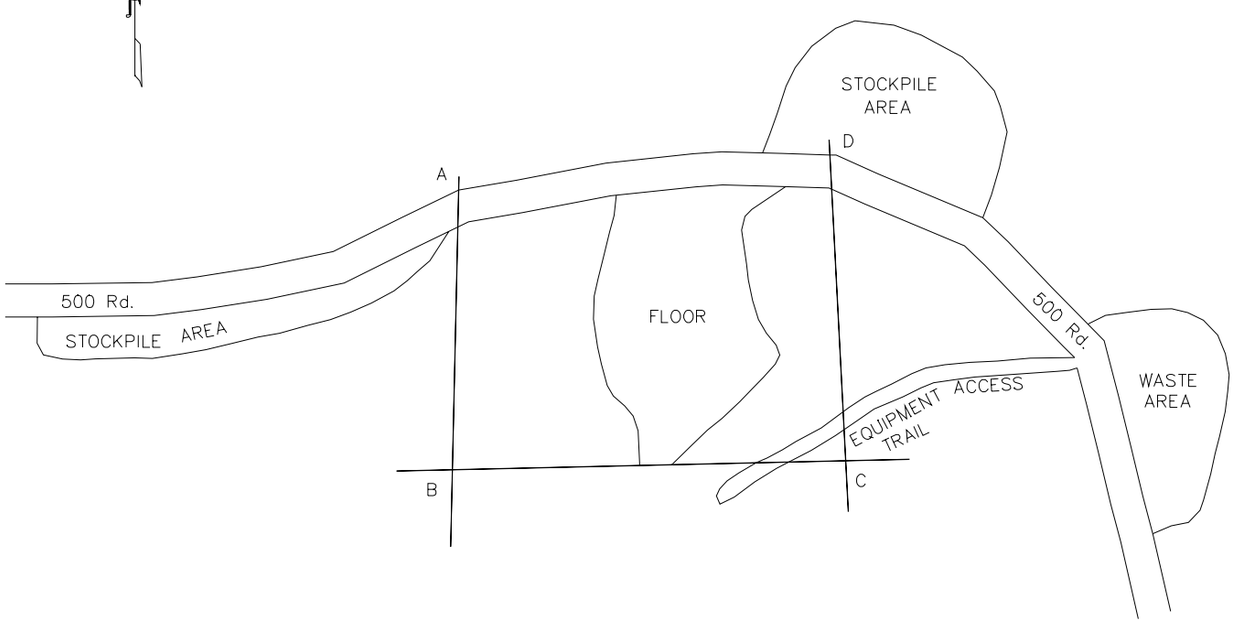
W-500 QUARRY DEVELOPMENT PLAN

SW ¼ SW ¼ SECTION 14, TOWNSHIP 11 NORTH, RANGE 3 EAST, W.M.

Scale: 1"=150'
C.I.=5'



(not to scale)



DEPARTMENT OF NATURAL RESOURCES - PACIFIC CASCADE REGION

SUMMARY - Road Development Costs

DISTRICT: Lewis

SALE/PROJECT NAME: After Hours CONTRACT NUMBER: 30-078843

LEGAL DESCRIPTION: Sect 17,20 - T11N R03E

ROAD NUMBER:	W-500A,B,C, W-538F.1	W-500	W-538, W538F
ROAD STANDARD:	Construction	Reconstruction	Pre-haul maintenance
NUMBER OF STATIONS:	22.15	0.00	51.84
SIDESLOPE:	0-25%	0	0
CLEARING AND GRUBBING:	$2,162	$0	
EXCAVATION AND FILL:	$14,660	$10,137	
MISC. MAINTENANCE:			$0
ROCK TOTALS (Cu. Yds.):		$9,537	
Ballast:	$3,219		$0
Surface:	$19,067		$0
Riprap:	$0		$0
CULVERTS AND FLUMES:	$1,528		$0
STRUCTURES:	$0	$10,833	$0
GENERAL EXPENSES:	$3,657	$2,746	$40
MOBILIZATION:	$2,213	$2,213	$2,213
TOTAL COSTS:	$46,507	$33,253	$2,254
COST PER STATION:	$2,100		$43

ROAD DEACTIVATION AND ABANDONMENT COSTS: $742

NOTE: This appraisal has no allowance for profit and risk.

TOTAL (All Roads) = $82,756

SALE VOLUME MBF = 2,500

TOTAL COST PER MBF = $33.10

Plans to be furnished by: Compiled by: Joe Smith Date: 03/31/06

PACIFIC CASCADE REGION - ROAD COST ESTIMATE - CONSTRUCTION

SALE NAME: After Hours

CONTRACT NUMBER: 30-078843

I. CLEARING AND GRUBBING:

Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
W-500A,B,C, W-538F.1 (Optional)	15	30	1.00	2.44	$40	1.00	20.87	$2,037
W538F.1 (Required)	15	30	1.00	2.44	$40	1.00	1.28	$125
			1.00	1.00	$32	0.80		$0
			1.00	1.00	$32	0.80		$0
			1.00	1.00	$32	0.80		$0
				1.00				

Clear and Grub TOTAL = $2,162

II. EXCAVATION:

Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
W-500A,B,C, W-538F.1 (Optional)	15	4.5	1.75	$88	1.00	20.87	$14,463
W538F.1 (Required)	15	1.0	1.75	$88	1.00	1.28	$198
	0	1.0	1.00	$66	0.50		$0
		1.0	1.00	$66	0.50		$0
		4.5	1.00	$66	0.50		$0

*End Haul, Over Haul, Large Fills/Cuts	Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
End Haul/ Over Haul				$0
Large Fills/ Cuts				$0

Excavation TOTAL = $14,660

III. BALLAST AND SURFACING :

Ballast source: W-500

Surface source: W-500

UNIT COSTS	Pit Run	4" In Place	
Drill & Shoot	$3.00	$3.00	
Dig and load	$1.00	$1.00	
Crushing		$3.50	
Purchase			
Haul *	$2.21	$2.21	$2.21
Spread	$0.80	$0.80	
Compact	$0.00	$0.45	
Strip			
Reclamation			
Use tax	$0.08	$0.21	$0.08
TOTAL ($/cy)	$7.09	$11.17	$2.29

Description	cu.yds/sta x stations =	cubic yards
Pit Run		454
4" In Place		1,707
		0

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

R.T. Miles =	6.0						
Ave. Speed =	25	Pit Run	454	Cu. yds @	$7.09	/cu. yd =	$3,219
Delay (Hrs.)=	0.1	4" In Place	1707	Cu. yds @	$11.17	/cu. yd =	$19,067
Cost / Hour =	$65.00	0	0	Cu. yds @	$2.29	/cu. yd =	$0
CY / Load =	10						

Rock total = $22,285

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter	No/Length	Installed Cost/ft	Sub-total
Crossdrain	4		18"	32	$11.80	$1,510
						$0
						$0
						$0
						$0
Bands & Gaskets	4				$4.50	$18

Culvert total = $1,528

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
					$0
					$0
					$0

Structure total = $0

Sub-TOTAL = $40,636

VI. GENERAL EXPENSES: Overhead & General Exp. Add 9% $3,657

VII. MOBILIZATION:

* Move in costs are averaged over all three sheets.

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	100	3	$300
Grader	400	1	$400
Compactor	400	1	$400
Excavator	450	2	$900
Dozer D8)	400		$0
Front end loader	400		$0
Rock crusher	$4,000	1	$4,000
Drill	$400	1	$400
Dozer (D5)	$240	1	$240

Total Mobilization = $6,640 Mobilization sub-total = $2,213

Road No. W-500A,B,C, W-538F.1

Standard: Construction

Stations: 22.15

SHEET TOTAL = $46,507

By: 0

Date: 01/00/00

W-500 Reconstruction

FISH CULVERT COSTS

Including design, build and adminstration costs

Culvert Id	L1103E22F	**Installation date**	
Legal Description	Sec. 15 - T11N R03E		
Project Description	Install Stream Simulation CMP @ 99+38 of W-500 Rd. in the Winston Cr. Block for After Hours TS		
Stream Width OHM	6.14		
Fill Height	6.5		

Structural Materials	**Diameter**	**Cost/foot**	**Length**	**Total Cost**
CMP 10 Ga.	120"	$174.73	62	$10,833

Misc. Materials	**$/unit**	**Units**	**Total Cost**
Stream simulation rock	8.89	225	$2,000
Rip Rap	8.5	240	$2,040
Surface and Bedding rock	8.5	450	$3,825
Back fill rock	6.5	100	$650
Bypass CPP	11.74	70	$822
Grass seed and hay			$200
	Subtotal		$9,537

Equipment	**Type**	**Cost/hour**	**Hours**	**Total Cost**
Excavator	892 JD	97	24	$2,328
Excavator w/ hoe pac	160LC JD	73	24	$1,752
Dozer	650 GTC JD	53	8	$424
Dump truck	3 axle	65	48	$3,120
Rock conveyor belt				$300
Mobilization				$2,213
		Subtotal		$10,137

Labor		**Cost/hour**	**Hours**	**Total Cost**
General Laborers		23	32	$736
Supervisor		30	16	$480
		Sub total		$30,508
Overhead and General Expenses	9%			$2,746
Total Project Cost				**$33,253**

PACIFIC CASCADE REGION - ROAD COST ESTIMATE - Road Closure and Deactivation

SALE NAME: After Hours CONTRACT NUMBER: 30-078843

Total stations Road Closure =

I. MISC. ROAD CLOSURE COSTS:

	Cost/ Station	Total Stations	Sub Total
water barring =	14.00	16.00	$224
ripping =			$0
culvert removal =			$0
medium sidecast pullback =	20.00	8.53	$171
grass seeding =	23.00	8	$184
tank trapping =	84	1	$84
			$0
			$0
			$0
			$0
			$0
			$0
			$0
			$0
			$0

Misc TOTAL = $663

VI. GENERAL EXPENSES: Overhead & General Exp. Add 12% $80

VII. MOBILIZATION:

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	100		$0
Grader	400		$0
Compactor	400		$0
Excavator	450		$0
Dozer D8)	400		$0
Front end loader	400		$0
Rock crusher	$0		$0
Dozer (D5)	$0		$0

* These move in costs are separate since they will occur after logging is done

Total Mobilization = $0

Road No. W-500
Standard: Road Closure
Stations: 0.00

SHEET TOTAL = $742

By: 0 Sheet 5 of 5 Date: 01/00/00

PACIFIC CASCADE REGION - ROAD COST ESTIMATE - PRE-HAUL MAINTENANCE

SALE NAME: After Hours

CONTRACT NUMBER: 30-078843

Total stations Pre-Haul Maintenance = 51.84

I. MISC. MAINTENANCE ITEMS:

	Cost/ Station	Total Stations	Sub Total
mechanical brushing =			$0
hand brushing =			$0
ditch cleaning =			$0
grading =	$4.50	51.84	$233
culvert cleanout =			$0
Smooth Drum Roller =	$2.00	51.84	$104
			$0
			$0
			$0
			$0
			$0
			$0
			$0
			$0

Misc TOTAL = $337

III. BALLAST AND SURFACING :

2.5" W-500

Description	cu.yds/sta x stations =	cubic yards
Ballast (4"-)		0
Surfacing (2 1/2"-)		0
Riprap		

UNIT COSTS	Ballast	Surfacing	Riprap
Drill & Shoot		$3.00	
Dig and load		$1.00	
Crushing		$3.50	
Purchase			
Haul *	$0.65	$0.00	$0.65
Spread			
Compact			
Strip			
Reclamation			
Use tax	$0.08	$0.21	$0.08
TOTAL ($/cy)	$0.73	$7.71	$0.73

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

R.T. Miles =	0.0					
Ave. Speed =	25	Ballast (4"-)	0 Cu. yds @	$0.73	/cu. yd =	$0
Delay (Hrs.)=	0.1	Surfacing (2 1/2"-)	0 Cu. yds @	$7.71	/cu. yd =	$0
Cost / Hour =	$65.00	Riprap	0 Cu. yds @	$0.73	/cu. yd =	$0
CY / Load =	10					

Rock total = $0

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter (in.)	No/Length (ft)	Installed Cost/ft	Sub-total
						$0
						$0
						$0
						$0
						$0
Bands & Gaskets						$0

Culvert total = $0

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
					$0
					$0
					$0

Structure total = $0

Sub-TOTAL = $337

VI. GENERAL EXPENSES: Overhead & General Exp. Add 12% $40

VII. MOBILIZATION:

* Move in costs are averaged over all three sheets.

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	100	3	$300
Grader	400	1	$400
Compactor	400	1	$400
Excavator	450	2	$900
Dozer D8)	400	0	$0
Front end loader	400	0	$0
Rock crusher	$4,000	1	$4,000
Dozer (D5)	$240	1	$240

Total Mobilization = $6,640 Mobilization sub-total = $2,213

Road No. W-500

Standard: Pre-haul maintenance

Stations: 51.84

SHEET TOTAL = $2,591

By: 0

Date: 01/00/00